the seedbank may be lying dormant but still be capable of recolonising once a suitable water regime is returned to the system. Discussion of aquatic plant dispersal concludes that estimates of how far from home wetland plants can be usefully collected should be based on the total range of any distinct form of a species.

New wetlands need to be planted with stock grown from seed or asexual propagules, transplants from other wetlands, or by direct seeding. Useful tips are provided on the collection, propagation and planting out of seedlings and other propagules. Control of pests to the newly planted wetland, such as rabbits, carp, waterbirds and common aquatic weeds, is discussed. The final chapter is an informative summary of what is known about the propagation, biology and ecology of common genera of aquatic macrophytes used in wetland construction and rehabilitation.

I recommend this book to readers who are considering constructing a wetland. As every wetland is unique, this book will make the reader aware of the areas of investigation that need to be undertaken for particular wetland projects. This book is complemented by Romanowski's *Wetland Habitats: A Practical Guide to Restoration and Management* which outlines the considerations and trade-offs involved in managing a wetland.

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Wetland Habitats: A Practical Guide to Restoration and Management

by Nick Romanowski

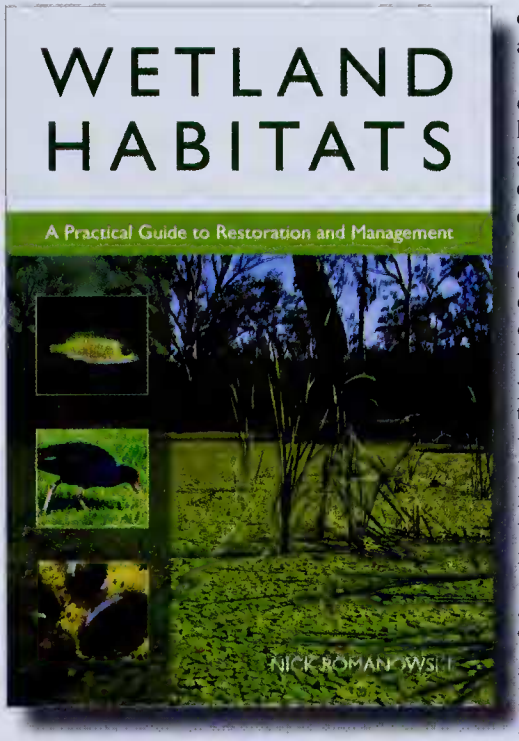
Publisher: *CSIRO Publishing, Collingwood, Victoria, 2010. 216 pages, paperback. ISBN 9780643096462. RRP $49.95*

Wetland Habitats reflects Nick Romanowski's interest and experience in the restoration and management of Australian natural and created wetlands. The book begins with a description of several types of wetland in terms of water quality and source, and the influence this has on determining the animal and plant communities that are associated with them. Many of the wetland types, impacts and threats, and key animal and plant species are illustrated with high quality colour plates.

Satisfactory habitat is not just a matter of the right water quality, shelter, food and a suitable place to breed, but is also affected by interactions with competitors and predators. Most wetland animals and many plants need more than one habitat for the long-term survival of the species. Many animal species move from one habitat to another as they mature, and their feeding or breeding requirements call for different resources.

Failings in wetland management to provide suitable habitat often stem from the fact that managers are prone to regard a wetland that looks attractive to them as one that should provide a desirable residence for the species it has been managed or created for. An attractive display of plants, the presence of water and a few species of birds are desirable parts of the wetland aesthetic; ephemeral wetlands are perceived as less desirable. Most created wetlands and dams have little habitat value for anything other than the most common and adaptable animals because their establishment did not have the specific requirements of a target species in mind.

Change over time, seasonal change, drought, flood and fire, changing salinity and physical movement of the wetland are discussed as natural components of wetland variability. Events such as flooding often trigger flowering in plants, and reproduction in fish, frogs



and waterbirds. Extreme events, such as drying out, demand that animals and plants associated with wetlands must also be able to move in response to these changes or avoid the extreme conditions in a dormant state such as seed or desiccation resistant eggs.

Major threats to wetlands are identified. Human activities involving drainage, construction of impoundments, irrigation, clearing, grazing, toxins, eutrophication, salinity, fishing, aquaculture and hunting have led to the degradation of wetlands. The introduction of weeds and alien species also poses serious threats.

The importance of background historical research and long-term monitoring in restoration is emphasised. A great deal can be achieved in terms of restoration using fairly obvious actions such as removal of drains, fencing and barriers to movement up and down stream for species such as fish. More natural timing of high flow events will trigger reproduction in plants and animals.

Weeds of disturbed areas, weeds ecologically equivalent to some natives, weeds we have to live with, floating weeds, no compromise weeds and indigenous plants as potential weeds are discussed with a view to looking at ways of dealing with them or working around them.

The background to the introduction of several species of alien animals, an overview of distribution, potential for spread and impact on natural systems is given. Broad approaches to management and control are outlined. Important questions to keep in mind are: Is the introduced species really a problem? and, What is the primary management goal for the wetland? For example, if the wetland is being managed to maintain a breeding population of long-necked turtle then swarms of introduced plague minnows may provide an abundant food source.

The last section of the book is an overview of common plants and animals found in wetlands. The habitat values of plants as food, sheltering and nesting material for animals are discussed. Different resources are provided by communities of aquatic, semi-aquatic, and terrestrial plants which occupy the open water, edge and riparian zones of a wetland. The specific resource needs of invertebrates, fish, amphibians, reptiles, birds and mammals are described.

Appendices containing an index of common and scientific names, a list of books and reports, and a glossary of terms are useful resources.

I recommend this book to readers who are looking for an overview of the factors to be considered, and the trade-offs involved in the long-term management of a wetland. This book builds on Romanowski's earlier publication *Planting Wetlands and Dams: A Practical Guide to Wetland Design, Construction and Propagation.*

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